

Abstract Submitted
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Sub-100 nm scale ablation by direct focusing of an extreme ultraviolet laser HERMAN BRAVO, FERNANDO BRIZUELA, GEORGIY VASCHENKO, CARMEN MENONI, JORGE ROCCA, Colorado State University, OSCAR HEMBERG, BRADLEY FRAZER, SCOTT BLOOM, JMAR Technologies Inc., WEILUN CHAO, ERIK ANDERSON, DAVID ATTWOOD, University of California, Berkeley — We have demonstrated single-shot ablation of sub-100 nm nanoscale holes using a focused extreme ultraviolet (EUV) laser beam. Very clean ablation craters with smooth walls were realized in poly-methyl methacrylate (PMMA) by focusing the 46.9 nm wavelength light from a table-top capillary discharge laser with a free-standing Fresnel Zone Plate (FZP). The smallest craters, 82 nm in diameter, were obtained by placing the sample near the third order focal plane of the FZP. The high quality of the ablation is mainly the result of chain scissions at EUV wavelengths and strong localization of the absorbed energy. This proof-of-principle demonstration sets the path for the development of new nanoprobe and nanomachining tools.

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